GNS – a short overview of users' expectations and demands

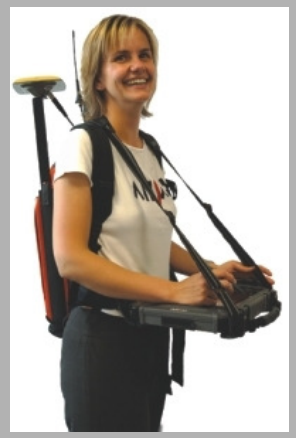
Dipl.-Ing. Bastian Huck
Dipl.-Ing. Michael Schulz
ALLSAT, Hannover, Germany

GNS – a short overview of users' expectations and demands

- Future Trends within the professional GNS Positioning and Navigation Markets
- Introduction of the new GPS+GLONASS+GALILEO receiver generation
- Overview of ALLSAT's activities in GALILEO
- Users' expectations
- GPS+GLONASS+GALILEO Urban Canyon Simulation

GNS Positioning Trends

+IMU



+Reflectorless
Laser Measurement

+Compass

+Camera

Seamless Integration of Business Processes with Geographic Reference:

Surveying

GIS

CAD

ERP

GNS Navigation Trends

Hybrid Navigation

using complex combination of different navigation methods

GNSS

IMU

Echo sounder

Radar

Radio-navigation

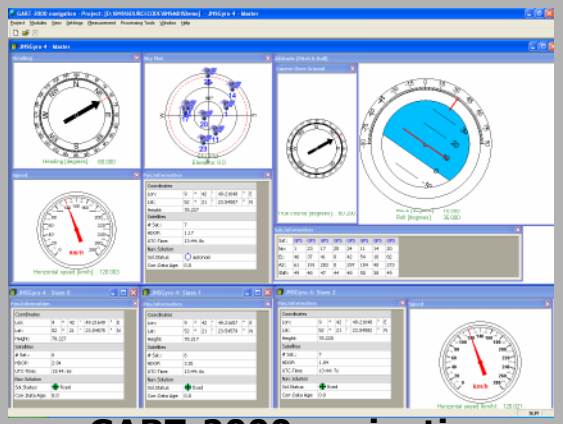
Odometer

Compass

Laserscanner

Video camera

Individual modular software or DLLs for easy handling



GART-2000 navigation

ALLSAT – System Integrator

JAVAD NAVIGATION SYSTEMS

Navigation

Positioning

TOPCON
Topcon Deutschland GmbH

System integration

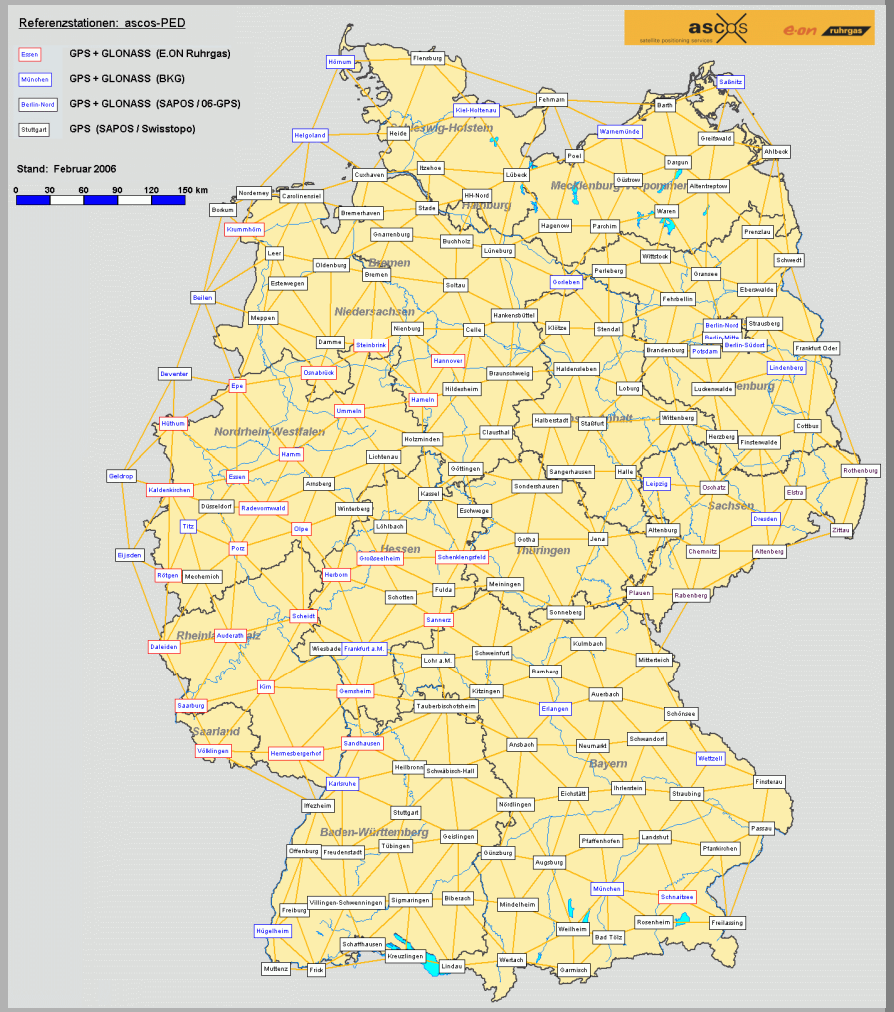
5-S approach:
Sensors + **S**oftware = **S**ystem
+ **S**ervice = **S**olution

New GPS+GLONASS+GALILEO receiver generation

JAVAD GeNiuSS™ & TOPCON Paradigm G3™
This Chip has **72** Universal Channels, capable of tracking all signals from all satellite systems that are currently in use and planned for the future.
GPS: L1, L2, & L5 carrier, CA, L1 P, L2 P, L2C
GLONASS: L1, L2, & L5 carrier, L1 CA, L2 CA, L1 P, L2 P
GALILEO: E2-L1-E1, E5, E6
WAAS/EGNOS

Through simple firmware changes, the selection of which signals and codes tracked can be changed very easily. Should new signals or frequencies be added or changed in the future, they can be accommodated through receiver firmware only, without expensive and inconvenient hardware changes.

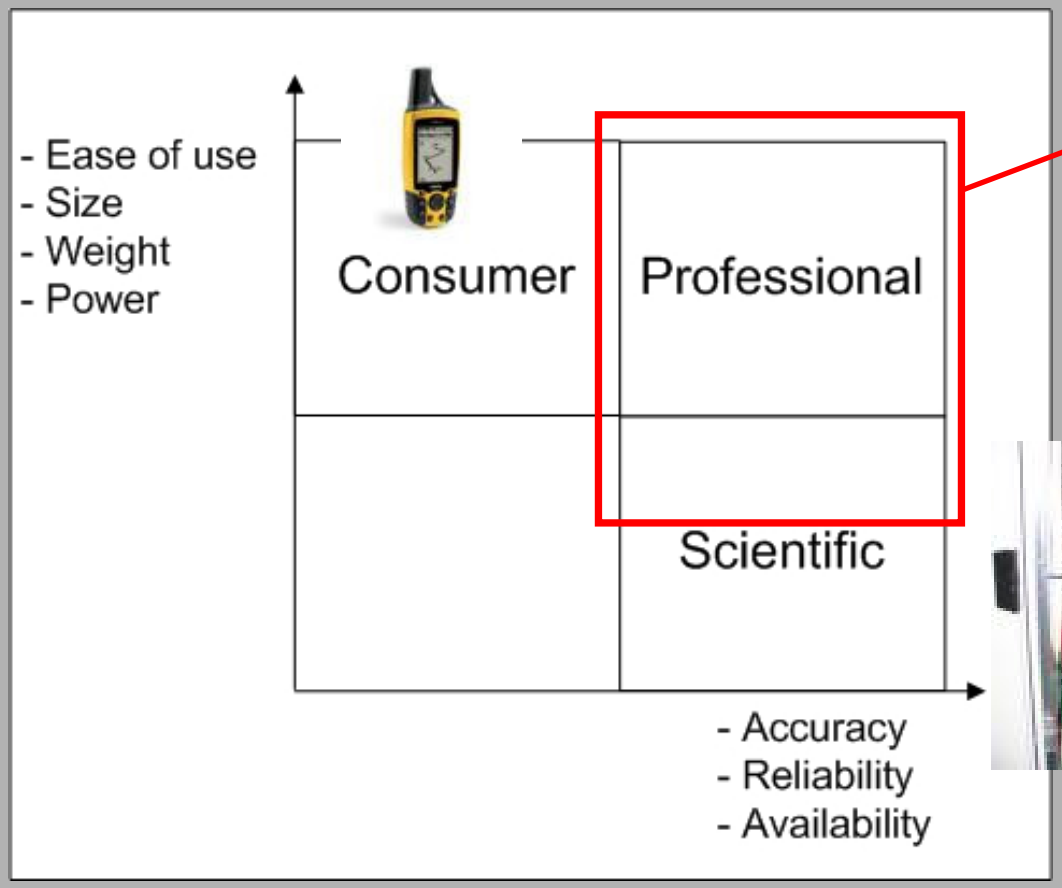
The introduction of the new GPS+GLONASS+GALILEO receiver generation will start in the reference networks



GNS – a short overview of users' expectations and demands

- Future Trends within the professional GNS Positioning and Navigation Markets
- Introduction of the new GPS+GLONASS+GALILEO receiver generation
- Overview of ALLSAT's activities in GALILEO
- Users' expectations
- GPS+GLONASS+GALILEO Urban Canyon Simulation

Market Overview
Positioning



ALLSAT's line of business

European 6th Framework Programme – Galileo 2nd Call

Area 1: User Segment
Area 2: Mission Definition and Implementation
Area 3: Innovation and International Activities

Area 1A: Business Development Projects
-> Introduction of GNSS into different application areas

-> GIGA

Area 1B: Technological Development Projects
-> Mass market receivers, professional receivers, safety of life receiver, interference mitigation

-> SWIRLS

SWIRLS

Objective:

- Development of a professional GALILEO receiver (prototype)

Co-ordinator:

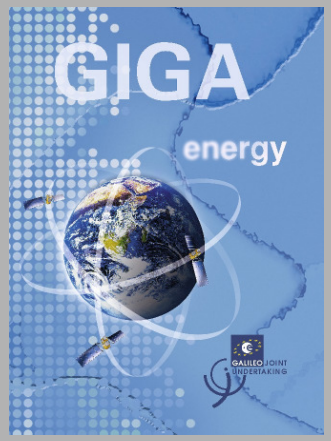
- Septentrio Satellite Navigation (Belgium)

- Nine international partners

Responsibilities of ALLSAT:

- Specification of user requirements with respect to GNSS-network infrastructure
- Specification and set-up of a test environment
- Implementation of a „Receiver Validation Acceptance Test"

GIGA
Galileo Integrated Georeference Applications



Objective:
- Introduction of GNSS to the energy sector

Six international project partners:
- Co-ordinator: E.ON Ruhrgas
- Core Team: ALLSAT, VCS

Responsibilities of ALLSAT:
- Project management
- Technical focus: GNSS applications and receiver interfacing

Duration:
- 18 months (Start: September 2005)

Contents of GIGA:
- **Definition phase**: acquisition of market data and fields of application
- **Implementation phase**: Development of a functional demonstrator
- **Interpretation phase:** Interpretation of results

GPS, GLONASS, GALILEO users` expectations

Increased Performance:

- Time To Fix Ambiguities (TTFA)
  - always < 30 sec
- Accurate Position
  - horizontal 2cm, increase in height accuracy
- Reliable Position
  - no extra measurement for verifying position
  - information when position exceeds expected accuracy level (integrity)
- Availability
  - precise measurement almost everywhere

GPS, GLONASS, GALILEO users` expectations

Current usage of GNSS versus Terrestrial:

50% 50%

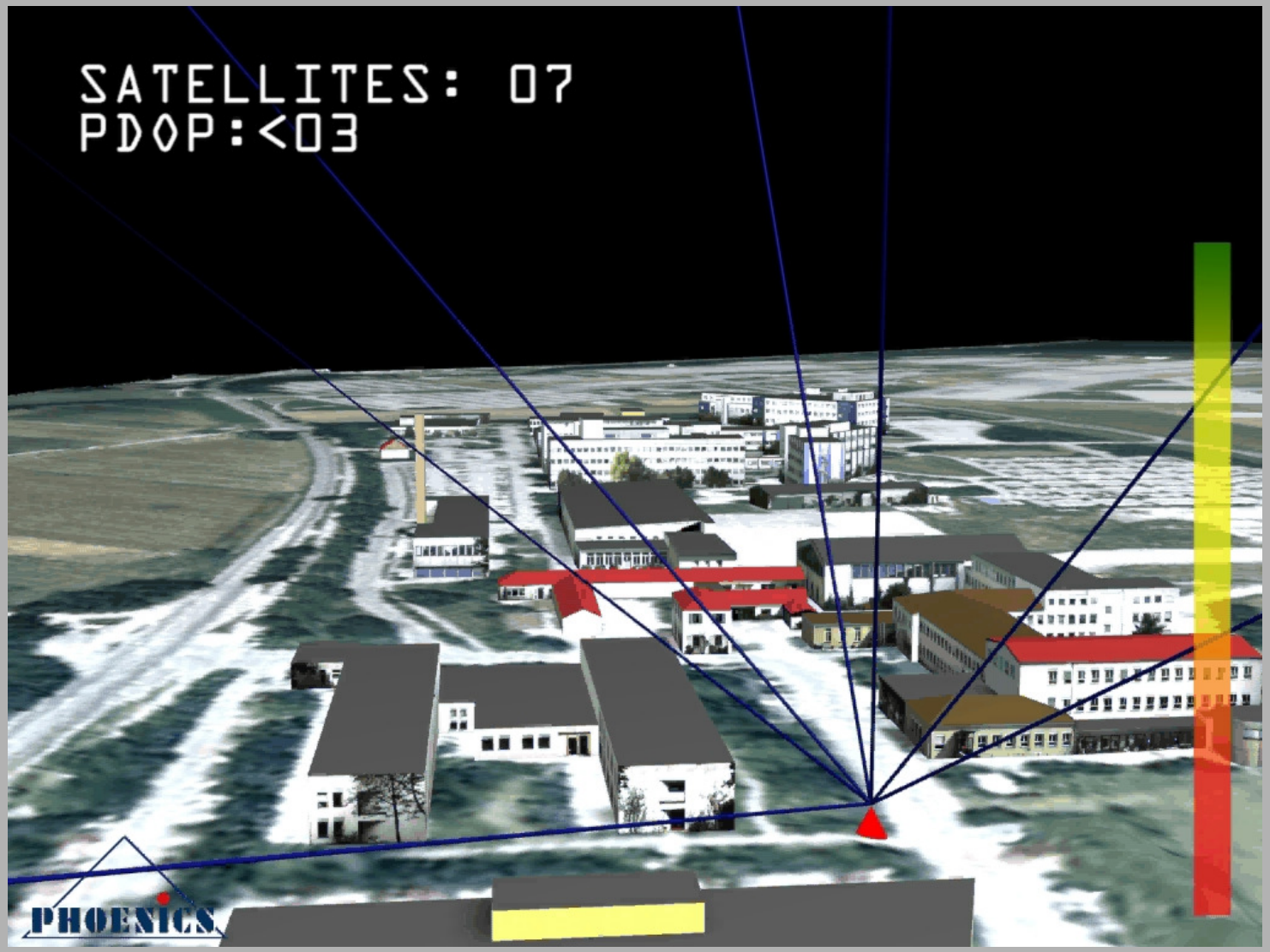
User`s expectation (GPS&GLONASS&GALILEO):

90% 10%

-> economical impact on positioning processes

Many Applications will benefit from GPS+GLONASS+GALILEO receiver technology

GPS, GLONASS, GALILEO
Performance Simulation



GPS, GLONASS, GALILEO
Performance Simulation

Simulation planned for today 12 pm:

- Satellite Visibility GPS/GLONASS:
  - Satellites' azimuths and elevations with real almanac
- Satellite Visibility GALILEO:
  - GSSF Tool (ESA) with support by VEGA
- 3D Data:
  - with support by Phoenics

GPS+GLONASS+GALILEO Performance Simulation

[Click to start]

GPS, GLONASS, GALILEO

GNSS receivers are already established measurement devices and will become even more powerful in the future!

Thank you for your attention

Questions?

Am Hohen Ufer 3a - 30159 Hannover - Germany

Fon: +49 (0)511-30399-0 - Fax: +49 (0)511-30399-66 - E-Mail: info@allsat.de – www.allsat.de